

WHAT IS CLAIMED IS:

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1. A disc drive comprising:  
a chassis;  
at least one disc;  
5 a spindle assembly rotationally supporting the at least one disc relative to  
the chassis to form a flow field along a surface of the at least one  
disc via rotation of the at least one disc;  
a head assembly including a suspension supporting at least one head  
positionable proximate to the disc surface; and  
10 a flow controller supported in the flow field along the disc surface and  
including a plurality of streamline flow passages to reduce  
turbulence in the flow field.
  2. The disc drive of claim 1 wherein the flow controller is a flow gate  
15 supported upstream of flow of the flow field to the head assembly.
  3. The disc drive of claim 1 wherein the flow controller is a flow gate  
supported downstream of flow of the flow field from the head assembly.
  - 20 4. The disc drive of claim 1 wherein the flow controller includes a plurality  
of flow gates supported in the flow field along the disc surface of the at least one  
disc.
  5. The disc drive of claim 4 wherein the plurality of flow gates includes an  
25 inflow gate to condition flow to the head assembly and an outflow gate to  
condition flow excited by the head assembly.
  6. The disc drive of claim 1 wherein the plurality of flow passages include  
circumferential radially spaced flow passages.

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7. The disc drive of claim 6 wherein the circumferential radially spaced flow passages are formed of a plurality of radially spaced circumferential fins supported relative to the at least one disc.
8. The disc drive of claim 1 wherein the flow controller includes a honeycomb structure forming the plurality of streamline flow passages.
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9. The disc drive of claim 1 wherein the flow controller includes a block structure forming the plurality of streamline flow passages.
10. The disc drive of claim 1 wherein the flow controller includes an array of tubes forming the plurality of streamline flow passages.
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11. The disc drive of claim 1 wherein the head assembly is pivotally supported to move between an inner position and an outer position and a width of the flow controller extends between the inner and outer positions of the head assembly to condition flow to the head assembly.
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12. The disc drive of claim 1 wherein the spindle assembly supports a plurality of discs spaced to form a gap therebetween and including at least one flow controller supported in the gap between adjacent discs.
13. The disc drive of claim 12 including a plurality of flow controllers
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- supported relative to the plurality of discs.
14. The disc drive of claim 1 wherein the streamline flow passages are angled between an inlet and an outlet of the flow passages to redirect the flow field.

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15. The disc drive of claim 14 wherein the streamline flow passages are angled to direct the flow field inwardly toward an inner diameter of the at least one disc.

16. The disc drive of claim 14 wherein the streamline flow passages are angled to direct the flow field outwardly toward an outer diameter of the at least one disc.

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17. A disc drive comprising:

at least one disc rotatable about a spindle axis and forming a flow field along a surface of the at least one disc and a head assembly supported relative to the surface of the at least one disc to read data from or write data to the at least one disc; and  
15 means for controlling flow along the flow field for reducing turbulent flow along the surface of the at least one disc.

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18. The disc drive of claim 16 wherein the means for controlling flow includes a flow gate including a plurality of streamline flow passages.

19. The disc drive of claim 17 wherein the flow gate is supported upstream of flow of the flow field to the head assembly.

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20. The disc drive of claim 17 wherein the flow gate is supported downstream of flow of the flow field from the head assembly.

21. The disc drive of claim 16 wherein the means for controlling flow includes a plurality of radially spaced circumferential flow passages.

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25. The combination of claim 22 and further comprising:

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26. The combination of claim 22 and further comprising:

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28. The combination of claim 22 wherein the streamline flow passages are angled to redirect the flow field.

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